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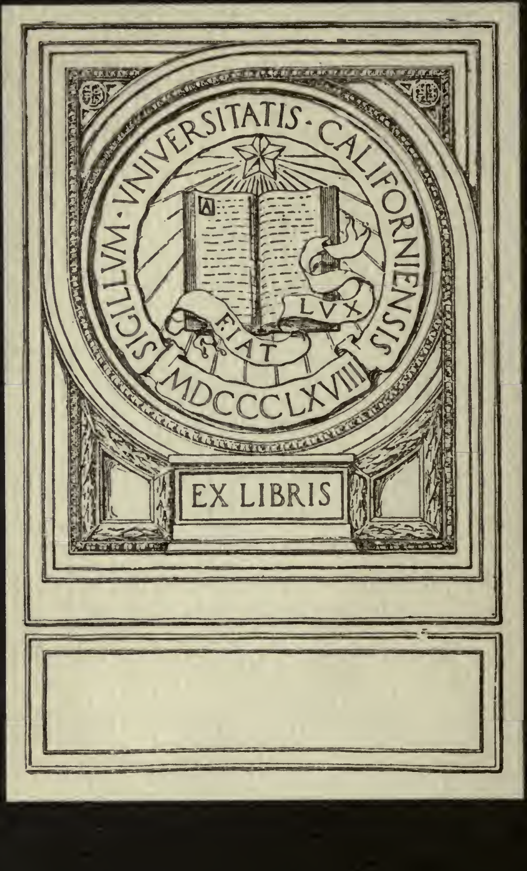

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OBSERVATIONS

ON

RAILWAYS

PARTICULARLY ON THE

PROPOSED

LONDON AND BIRMINGHAM

RAILWAY.

LONDON
WHITTAKER, TREACHER, AND ARNOTT.
BIRMINGHAM
BEILBY, KNOTT, AND BEILBY.
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OBSERVATIONS

ON

RAILWAYS.

Railways, as every-body knows, are roads formed by bars of iron, or rails, upon which rails the wheels of the carriages are to run.

Two bars, each about fifteen feet long, are laid parallel, nearly five feet apart, and thus placed they form what is called a line of road. They are from two to three inches in width, and are supported, at intervals of about three feet, upon blocks of stone, or sleepers of wood; these are afterwards covered with earth, gravel, &c. so that the rail stands about two inches above the ground.

The expense of a railway will vary according to the number of lines of which it consists, the nature of the country through which it passes, the value of land and materials, &c.

Railways may be made to suit any particular circumstances of traffic. Through a densely

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peopled tract of country, filled with manufacturing industry, the interchange of goods and the intercourse of men, may require several lines of rails, and will justify the greater expense; but even a people scattered over a pasturing district would find their advantage in having a communication by a railway with large towns. The sale of cattle, sheep, poultry, milk, butter, &c. would extend far beyond the slow and more expensive transit of a common road or a canal. Much more also would an agricultural district benefit by that conveyance which offers the quickest and cheapest transport for grain to the great markets.

The characteristics of a railway, are, the small resistance, or friction, which it opposes to bodies moving on it; and the security it affords, by confining the wheels to a uniform track. These wheels are about the diameter of the fore wheels of a coach, are twice the width, and have a projection on the inside of the rim or feloe, of about one and a half inch deep, which prevents their slipping off the rails. This projection is called the *flange*.

Travelling upon a railway is attended with less risk of accident, or injury, than any other mode of conveyance; between 80 and 90,000 persons have been carried on the Liverpool and Manchester Railway, since the middle of September, and no other accidents have happened than those arising from men's own wilfulness or carelessness; or such as are not confined to railways alone.

In fact, two accidents only have occurred to passengers, and those of slight consequence.

Many of the circumstances which occasion accidents upon a common road cannot take place upon a railroad, which is watched by a vigilant police.

The effects of friction, or resistance to motion, may be thus exemplified: a horse which will draw one ton upon the best turnpike road, at two miles an hour, will draw twenty tons upon a railroad, at the same speed, for the same period of time; and the same horse will draw upon a canal, a weight of forty tons, at two miles an hour, for the same time. But the resistance upon a common road, or railroad, is uniform at all velocities; whereas the resistance upon water varies as the square of the velocity.

Hence the same power which moves forty tons upon a canal at two miles an hour, will only move ten tons at four miles; and perhaps not so much as four tons at six miles an hour. But upon a railroad, if the moving power be uniform, the weight will vary inversely as the velocity. That is to say, the same power which moves forty tons at ten miles an hour, will move twenty tons at twenty miles an hour.

Although the advantages of a railway for the conveyance of passengers and goods are very superior to any other mode, even when horses are employed as the moving power; yet, these advantages are vastly increased by the substitution of Locomotive Steam Engines.

This application of steam power, renders easy the personal intercourse of people residing at the extremities of the land, and brings into contact communities which have heretofore hardly heard of each other. People then find that wants which they have hitherto been unable to supply, demands which till now they could not satisfy; desires which were suppressed as soon as conceived, from the hopelessness of their gratification; are all brought within their reach, by the contrivance of a cheaper and quicker mode of travelling.

In the great markets of Europe we are met by foreign competition, and we must reduce the price of our goods, or abandon commerce altogether. Since the times when the sagacity of Arkwright contrived the means of multiplying manufactures, which the penetration of Brindly and the patriotism of Bridgewater succeeded in diffusing at home and abroad; there has been no invention fraught with more important consequences, than that which enables steam engines to convey to the ports of embarkation, the multifarious products which the genius of Watt has caused to spring forth.

Notwithstanding, however, the general admission of the benefits which a country derives from good roads, it is remarkable that railroads (which are roads of the most improved description), have had to encounter the most violent opposition. There are persons who have stigmatized railroads as a nuisance. We can easily understand in what sense they are a nuisance to those who have an interest in taxing the public with expensive means of transport; but to talk of a cheap conveyance as a nuisance, is, as if one should curse with that epithet, the horse whose services supersede the functions of the nether extremities of that nobler animal—man. No doubt, the horses introduced by the Spaniards were a nuisance to the tramping carriers of Mexico and Peru.

Most of the arguments urged against railways, are equally applicable to all means of communication whatever: and as society has already pronounced upon this matter, that the best roads are those which comprise cheapness, rapidity, and certainty, (or in the case of persons, safety) of conveyance, we have only to shew that a railroad is cheaper, quicker, more certain, and more safe; and all such objections will be overthrown.

The Stockton and Darlington Railway would afford us the means of proving all these points; but as the coaches there are drawn by horses, we will confine ourselves to the facts of the Liverpool and Manchester Railway.

The fare between these towns for inside passengers by the railway, is five shillings; before the opening of the railway it was twelve and fourteen shillings by the ordinary coaches. The distance between the towns is run on the railway in two hours: by the turnpike road it occupies four and a half or five hours.

The charge for conveyance of goods by the railway is so much less than that heretofore charged by the canals, that the canal charges have been lowered by the competition ahout one-third.

Goods shipped at Liverpool by water conveyance to Manchester, are thirty-six hours on the passage; but by the railway they are delivered in about five hours.

The passage by water between Liverpool and Manchester is uncertain; from the effects of wind and tide, one half of the distance being an open river; but this part is proportionably cheaper than the canal, because wind is the moving power.

This part is moreover attended with risk, for the same reasons. And in winter, the canal part is frequently frozen for many weeks, so as to obstruct all passage; and goods have to be transferred from the canal to land carriage, suffering a loss of time, increase of expense, and risk of damage in the transfer.

It is not necessary to remind men of business, that if goods are not delivered to time, bills are put off on the plea of a loss of market.

It is justly observed that, " the saving of time is the greatest of all savings."

Having before stated the number of persons conveyed between Liverpool and Manchester, and that trifling accidents had happened to only two persons ; we repeat the assertion, that railway travelling is safer than other modes of public conveyance, of which the Stockton and Darlington Railway furnishes further proof.

Let the investigation be made into the accidents which happen on a railway and a turnpike road ; we will abide by the result.

It is said that railroads will be obstructed by frost and snow. Railroads have been used for many years in the northern coal districts, and we have not heard of their suffering any obstruction so great as attends a common road in winter, much less such as belong to a canal. Snow will not lie in deep cuttings, because the temperature is higher than that of the surface ; and the effects of frost, or ice, on the rails are easily obviated : the worst that can happen is a slight detention, till the ice that may have formed on the rails is broken.

We think that no more need be urged to shew that a railway is a cheaper, quicker, and safer mode of travelling, and a more certain and more safe conveyance for goods than any yet in use.

It is, however, objected to Locomotive Engines that they eat no oats, and that they displace the horses which do. We admit the fact, but dispute the inference, as leading to the conclusion that fewer horses will be required throughout the country, by the general establishment of railroads.

Fewer post horses and fewer coach horses will be required, but more horses will be demanded for agricultural purposes and for pleasure. People can afford to keep more horses by the saving of expense in travelling, and in the carriage of goods; and traffic will increase by the side of a railway.

But if the number of horses was reduced, and a smaller quantity of oats grown, where would be the harm? At present we import a considerable proportion of oats from abroad, from the consumption of which the farmer receives no benefit, and by the non-consumption of which he could suffer no injury. And if the land now employed in growing oats at home was no longer wanted for that purpose it would be better and more profitably occupied in the production of food for men.

It was argued against Canals, that they would cause fewer horses to be wanted; but it has not so happened.

Locomotive Engines will do a great deal more work at the same expense as a given number of horses; or they will perform the same quantity of work at less expense. They, therefore, by lessening labour, make things cheaper, and benefit all who live by labour. A Locomotive Engine will draw forty tons at a speed of 15 miles an hour.

It would require at least eighty horses to draw the same weight, at the rate of ten miles an hour.

If the expense of those horses and the Engine were equal, there would still be a saving of time, which every man feels to be a saving of money whenever he gets a bill discounted.

But the expense of an Engine, for an hour, is perhaps less than 1-30th of the expense of eighty horses. The Engine can however work the twenty-four hours round, whereas a horse can only work one hour, if he goes at ten miles an hour.

The money thus saved is employed in paying for some other kind of labour, which before had no existence, or existed in a minor degree; and thus are they who live by labour benefitted.

It is objected to Locomotive Engines, that they cannot easily be stopt; and therefore, that their use is attended with great risk of human life. This is altogether a mistake. An Engine and train of ninety passengers, may be brought to a stand still, from fifteen miles an hour, in the space of about sixty yards.

Another objection is, that steam engines throw out vast quantities of smoke, and smoke is very offensive.

The Locomotive Engines used on the Liverpool and Manchester Railway are prohibited from smoking by Act of Parliament, and they are obedient to the law. The fuel is coke, which emits no smoke.

The effective force of a Locomotive Engine, depends upon its weight, in connexion with the relations of the boiler and cylinder.

If the cylindrical power be greater than the adhesive capability, a waste of fuel will be the consequence. If the cylindrical power be below the adhesive capability, a greater expense of materials will have been incurred than necessary.

In general, an Engine will draw on a level about ten times its own weight, at a speed of above ten miles an hour,

The effect of an inclined plane in reducing the effective force of an Engine is very considerable, even when the inclination is so small as to be hardly perceptible to the eye.

An Engine which will draw one hundred tons on a level, would draw only fifty-five tons up an inclined plane of 1 in 300; forty-four tons up a plane of 1 in 200; twenty-nine up a plane of one 1 in 100; and seventeen up a plane of 1 in 50.

This shews the importance of having Railways as nearly on a level as possible.

They should also have very little deviation from a straight line; because upon a curve it requires the wheels of one side to be of larger diameter than those of the other side; and besides, the lateral pressure has a tendency to twist the rails.

Although the success of the Liverpool and Manchester Railway has fulfilled the expectations, and almost realised the most sanguine hopes of its projectors; yet it is contended that this affords no adequate criterion by which to estimate the probable advantages of other projected Railways.

This argument is urged against the proposed London and Birmingham Railway; but we assert, that the conditions and circumtances which called for a Railway between Liverpool and Manchester, and ensured its being a successful undertaking, are equally in existence with respect to the travelling, and carriage of goods between London and Birmingham.

Another Railway is already projected between Liverpool and Manchester ; and if the traffic between these towns is considered sufficient to employ two such expeditious means of transport, much more will the traffic between the Metropolis and the great manufacturing district around Birmingham, employ one Railway.

Every one engaged in this traffic, is well acquainted with, and indeed, most persons have experienced to their cost, the inconveniences of the slow, circuitous, uncertain, and in some respects hazardous conveyance of goods by the canal; and it is not necessary, therefore, to give instances in proof.

But the only remedy being to send the goods by the waggon, at the same slow rate and nearly equal risk, and at twice the expense; or by the fly vans, at thrice the expense of the canal; it is only articles of small bulk and large value that will pay the enormous charges of road conveyance.

All this a Railroad will remedy, by providing a cheaper carriage at a lower charge.

It takes seventy hours to go by canal between London and Birmingham, twenty-one hours being wasted in passing the locks, the distance being one hundred and forty two miles; the Railway will convey goods in six or seven hours at farthest; and at a less cost.

There are forty coaches pass daily between London and Birmingham; the inside fare of which, is about £2.; and the time expended by the fastest coaches, is twelve hours. The fare by the Railway will not exceed £1. and the distance may safely be run in five or six hours.

The outcry which is raised against Railways, because of their being injurious to canal property, is a sort of clamour with which the world is well acquainted, and knows perfectly how to appreciate. From the craftsmen of Ephesus to the present moment, there have been those who try to delude men into the belief, that the craft by which they have their wealth, is that by which alone the public can benefit.

The facts we have stated overthrow all such sophistry.

The public has a right to have the opportunity of chusing between Railways and other modes of conveyance; and it will adopt that which suits the public interest. By the test of these principles the London and Birmingham Railway will stand or fall.

It is urged against this Railway, that it will cost so much money that it will never pay.

The public we apprehend has nothing to do with this, so long as there is security that the undertaking will be completed; and of this Parliament will take care.

When Hugh Myddleton succeeded in turning the New River out of its natural bed, for the supply of fresh water to London, he ruined himself, because his private fortune was unequal to so vast a project. But the public derived a benefit which is far beyond any money estimate, although the shares are now worth one hundred and fifty times their original value.

Yet this New River upset the occupation of the water carriers whose business it had been to bring this necessary article of food, cleanliness, and health, by buckets full, at a price which placed it out of the reach of the working people, except in the smallest possible quantities for the sole purpose of cooking their victuals.

But the water-carriers had as good a claim for protection against the New River and Hugh Myddleton, as Canal Proprietors have now against the London and Birmingham Railway Company. And if in those days the same facilities had been given as now to the formation of Companies for executing works which are beyond the compass of an individual fortune, Myddleton need not have been a martyr to the public good. He would in fact have reaped great profit from the measure. How did the projectors of Canals meet the arguments of those who contended for protection to the turnpike road interest, the waggon interest, &c.?

But those who exclaim against the cost of making Railways, would seem to be ignorant that Canals are nearly as expensive. And it is quite plain that a Railway which can do at least six times as much work as a Canal, (for it will carry the same weight in one-sixth of the time, at a less cost), would pay as well as Canals have paid, even if it cost six times as much in the making.

The result of a calculation of the sums annually paid for travelling, and for carriage of goods by coaches, fly vans, waggons, and canal, between London and Birmingham, shews a gross receipt, upon the lowest estimate, of £800,000; one half of this would remunerate the shareholders in the Railway, even upon a larger outlay than the present estimate.

It is well known that the produce of the mineral districts in the midland counties can only partially find its way to the great market of the Metropolis, which thus suffers in a degree the evils of monopoly prices, and the inconvenience of a limited supply.

We cannot close these observations without some notice of a subject which is at this time of peculiar importance as connected with the London and Birmingham Railway, and its extension to Liverpool.

The executive government has always viewed an easy intercourse with Ireland as of the utmost consequence to the welfare of both countries, as serving to bind by the ties of mutual interest, of reciprocal good offices, and of interchange of products, the individuals of the two nations; and thus cementing that union, de facto, which thirty years ago was effected by an act of the legislature.

In accordance with these views a large capital has been expended in shortening and improving the Holyhead Road; we understand it has already cost above £2,000,000, and that a further grant of £600,000 is to be moved for in the House of Commons, for the purpose of saving two hours and a half. By this road the communication between London and Dublin cannot be made in less than thirty-six hours.

But by a Railroad from London to Liverpool it would occupy only twenty-four hours; the distance being the same in both cases. Now, if it be worth while to incur an expense of £600,000 in order to save two hours and a half, the saving of twelve hours, which the Railway will effect, is worth £2,880,000.

The Committee on the Holyhead Road have placed on record the saving effected, and the advantages derived from a quicker transmission of letters and dispatches by the improvement of the road.

But all this is accomplished by loans from the public.

The London and Birmingham Railway Company, together with the Birmingham and Liverpool Railway Company, propose to give to the public still greater advantages than those which are stated by the Committee to have already accrued, from quicker communication; and to do this, not by calling on the public, through the government, for the advance of a large sum of money; but by advancing themselves the whole sum necessary, and thereby relieving the community from such a tax.

But Railways, it is said, will throw men out of employment. The grooms and attendants upon coaches and waggons, &c. will no longer be wanted. True. But it is a great error to suppose that less of human labour will consequently be required. Every thing which cheapens the cost of production increases the demand for the thing produced, and brings into action a greater number of persons than are temporarily displaced by the change.

The reason is, "that when the most pressing wants are supplied, and supplied amply by cheapness, the consumer has money to lay out upon new wants; that when these new wants are supplied cheaply, he goes on again and again to other new wants; that there are no limits, in fact, to his wants as long as he has any capital to satisfy them."*

Let any man calculate the cost of abolishing in his house the use of bells. If he required the same work to be done he must have additional servants. Bells have, therefore, thrown men and women out of work. Yet a far greater number of domestics are now employed than formerly, when persons who could afford it had always a number of attendants lounging about within call, because they had no ready means of summoning them from a distant part of the house.

Few, however, in those days could afford to have any servants at all.

We know of no remedy for the inconvenience which must necessarily fall upon certain people by every change which takes place in the employment of capital; and these are changes which are continually going on, which no laws can prevent though they may obstruct, but which all sound lawgivers will desire to facilitate.

The wisest course is not to strive against the stream of improvement; but to accommodate ourselves as quickly as possible to the new work which the change induces.

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* See "The Result of Machinery" p. 186.

It may be considered as a set off against the arrangement which one description of labourers may temporarily suffer by the London and Birmingham Railway, that in the formation of this road many thousand labourers, besides artificers of various trades, will be employed by the circulation of £3,000,000 of capital, which does not now give work to so many persons, because it is vested in a manner that is less productive.

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